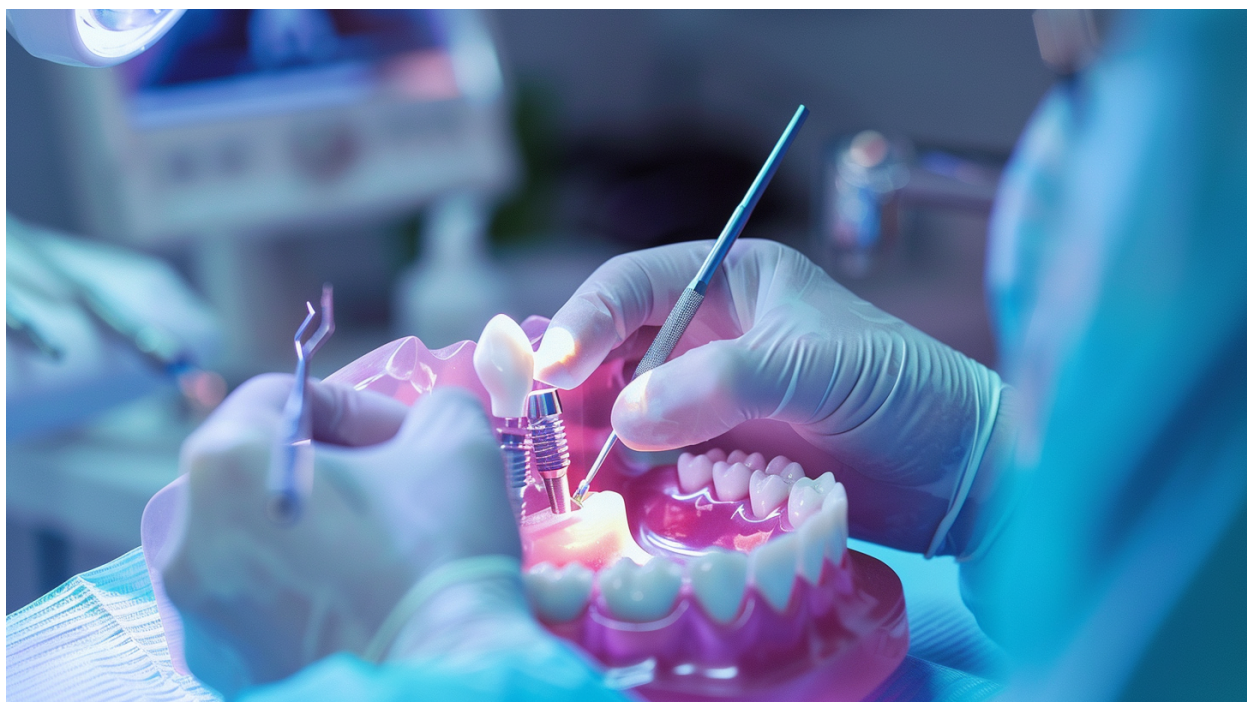


A Clinical Guide to Guided Implant Drilling Techniques for Parallel and Tapered Implant Systems



Dental implant placement requires precision, planning, and a deep understanding of bone biology and surgical protocols. Guided surgery systems have significantly improved accuracy and predictability, allowing clinicians to achieve optimal implant positioning while minimizing risk. One of the most widely used systems in modern implantology is the guided drilling approach supported by digital planning and surgical templates.

Many clinicians rely on [ABguide for doctors](#) to streamline guided implant procedures and ensure consistent results across different bone types and implant geometries.

Parallel Shaped Implants (I2 Shape)

Parallel implants are commonly used when uniform osteotomy preparation is required. These implants depend heavily on precise drilling sequences to ensure stability and correct positioning within the bone.

Step-by-Step Guided Drilling Protocol

The drilling process begins using the ABGuided Drill Kit in sequential order, starting with the 2mm drill. Each drill is selected according to the color-coded system indicated in the surgical report, which corresponds to the sleeve color in the surgical guide.

The Drill Tool is placed securely inside the guide sleeve. Each drill used matches the exact diameter of the Drill Tool, ensuring controlled and accurate osteotomy preparation.

Controlled Depth and Cooling

Drilling is performed gradually with continuous irrigation to prevent overheating. The drill is advanced until the built-in stop contacts the Drill Tool, preventing over-penetration. In-out movements are used to gradually reach full depth.

The ABGuided software automatically calculates drill depth, factoring in implant length, soft tissue thickness, guide height, and Drill Tool dimensions. This ensures precise depth control relative to the implant apex.

Final Drill Considerations

The last drill used is typically 0.5mm smaller than the planned implant diameter. In softer bone types such as D3 or D4, the reduction may increase to 1mm to improve primary stability.

The widest drill in the ABGuided kit is 3.65mm, suitable for implants up to 4.5mm. For larger implants, drilling is completed without the guide using standard AB Dental kits. Final diameter selection should always be based on clinical judgment and bone quality assessment.

Tapered Implants (I5 Shape)

Tapered implants feature deeper threads designed to enhance primary stability by engaging bone more effectively. Because of this design, less drilling is required compared to parallel implants.

Modified Drilling Sequence

The initial 2mm drill is used to full depth as the foundation of the osteotomy. Subsequent drills are selected based on implant diameter and length, creating a shape that is wider coronally and narrower apically.

The apical preparation is intentionally undersized by approximately 1mm compared to the implant's apical diameter to improve stability.

Diameter-Specific Protocols

For a 3mm implant, only the 2mm drill is used to full depth. For a 3.75mm implant, a 2.5mm drill is used to full length. Additional drills are not carried to full depth but are limited to coronal preparation.

The final drill is typically 1mm smaller than the coronal implant diameter and is used only for the upper one-third of the osteotomy. In very soft bone (D3–D4), under-preparation may increase to up to 2mm less than the implant diameter to enhance stability.

Clinical Judgment in Osteotomy Design

While digital planning provides precise guidance, the clinician must always apply experience and judgment when selecting final drill diameters. [Bone density](#), anatomical conditions, and implant stability requirements all influence the final decision.

Final Thoughts

Guided implant surgery enhances precision and predictability in both parallel and tapered implant systems. By following structured drilling protocols and using systems like ABguide for doctors, clinicians can achieve controlled osteotomy preparation tailored to bone quality and implant design. Proper sequencing, depth control, and clinical judgment remain essential for achieving long-term implant success.